



Armed Forces College of Medicine

AFCM



Large Intestine

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INTENDED LEARNING OBJECTIVES (ILO)



By the end of this lecture the student will be able to:

1. List parts of **large intestine**.
2. Differentiate between a loop of small intestine & that of large intestine.
3. Describe peritoneal covering & relations of parts of large intestine
4. Describe blood supply of large intestine.
5. Describe surface anatomy of **vermiform appendix** & referred pain in case of inflammation.

Key points

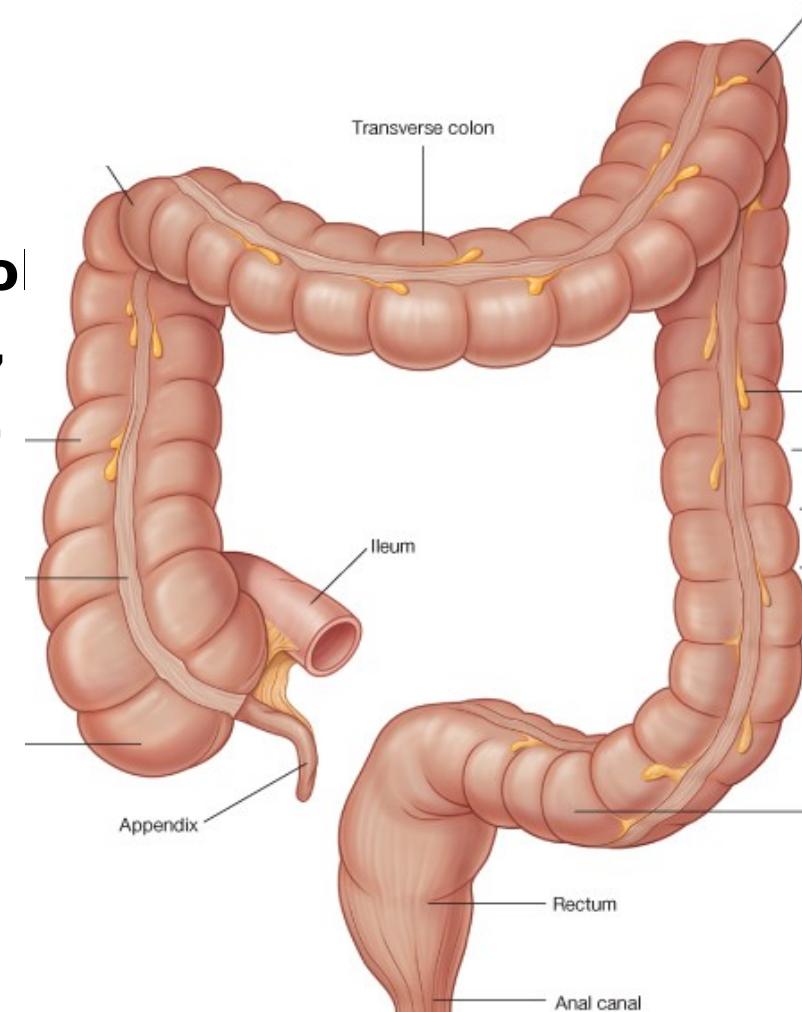


- Differences between small & large intestine
- Parts of large intestine
- Blood Supply & lymphatic drainage of large intestine

Large Intestine

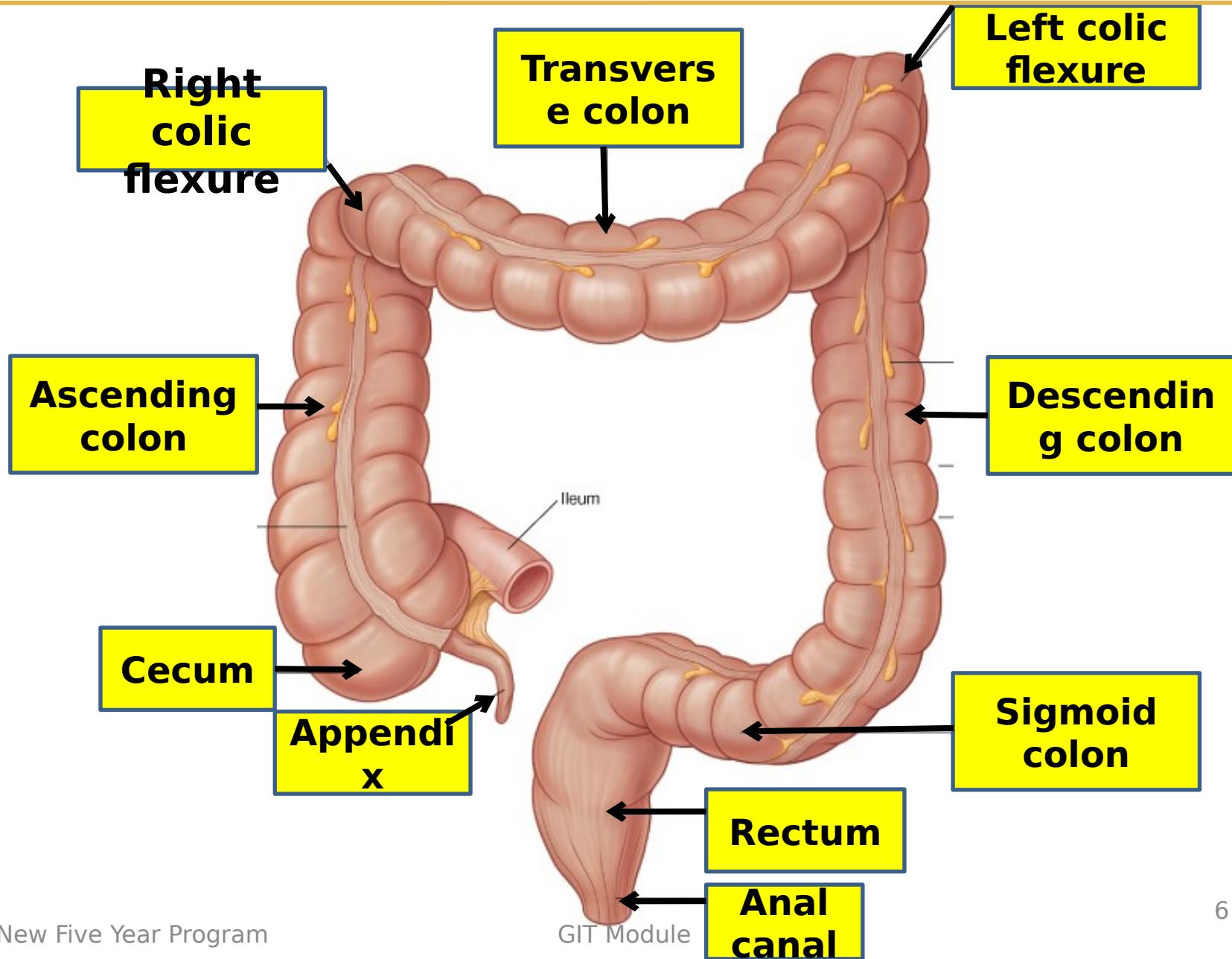


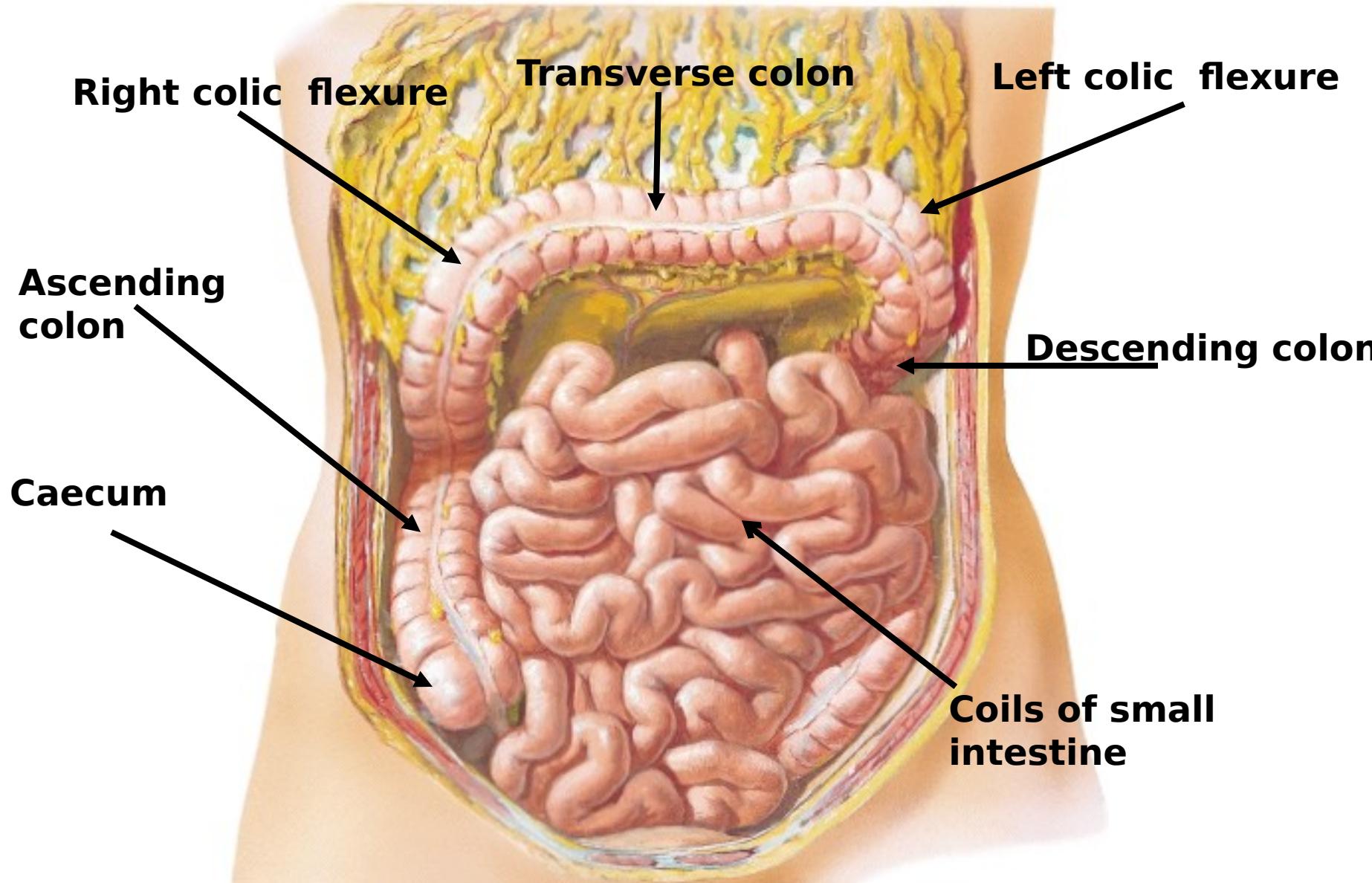
- **It begins at end of ileum &**
- **Ends at anal orifice (1.5 meters)**
- **It consists of cecum, ascending colon, right colic flexure, transverse colon, left colic flexure, descending colon, pelvic colon, rectum & anal canal.**
- **Larger than small intestine, less mobile & peripheral in position**



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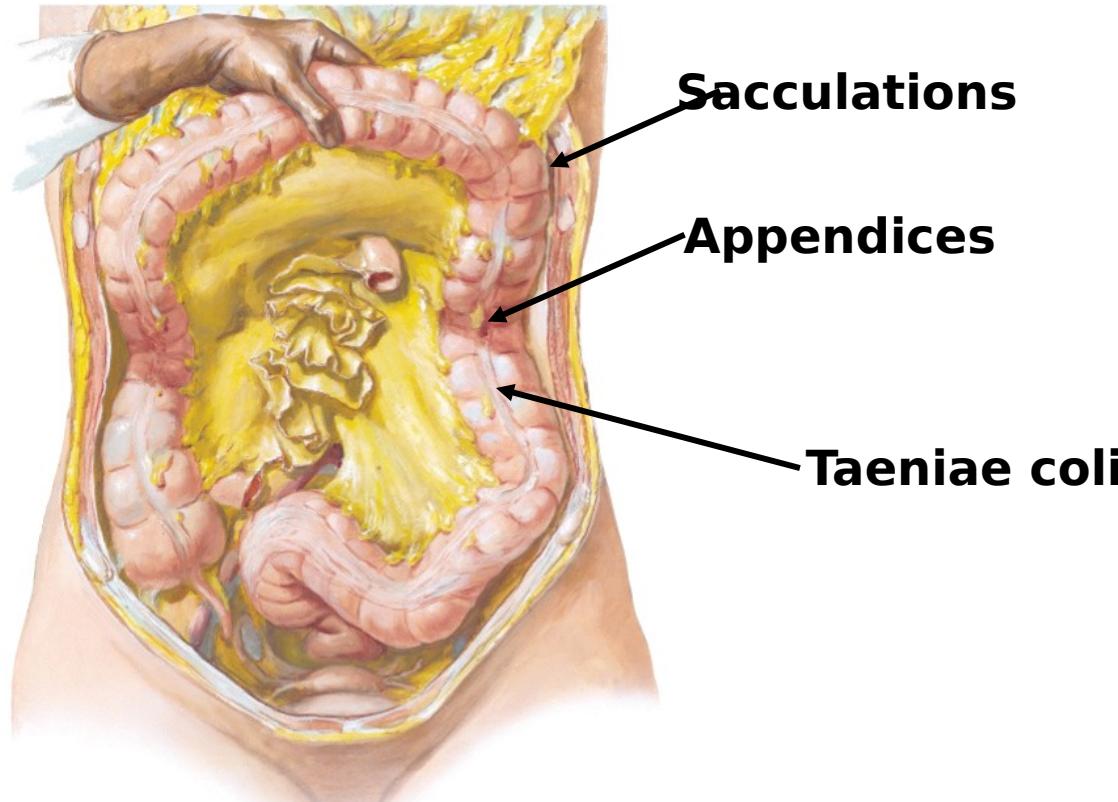
Parts of Large Intestine

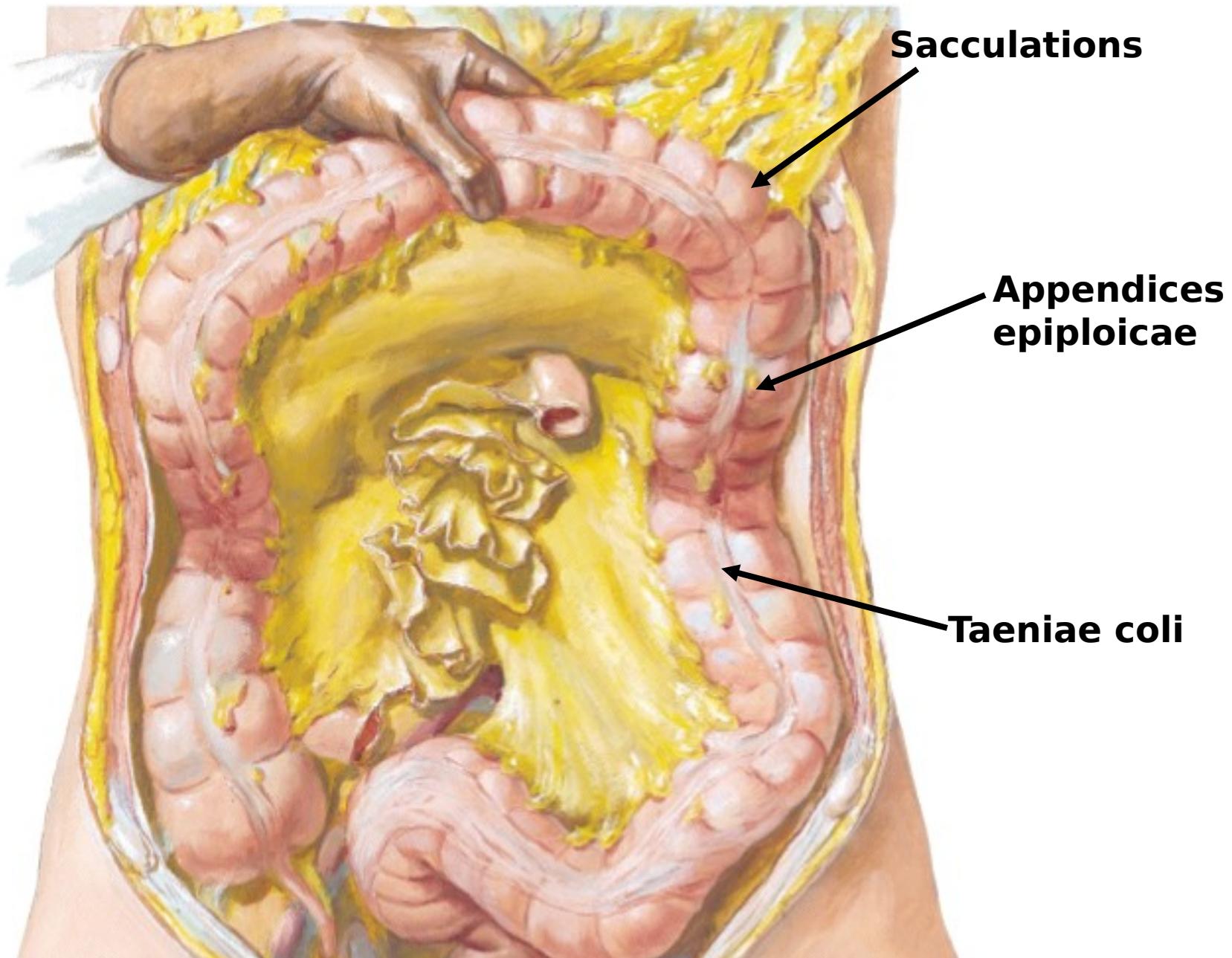




The wall shows:

1. **Taeniae coli**: 3 bands of longitudinal muscle layer, they begin at base of appendix & terminate at sigmoid colon
2. **Sacculations**: bulging in wall of colon because the length of taeniae coli is shorter than length of colon
3. **Appendices epiploicae**: peritoneal folds filled with fat ,Absent in caecum , appendix & rectum





<i>Differences</i>	<i>Large intestine</i>	<i>Small intestine</i>
<i>Length</i>	meter (1.5)	6 meters
<i>Calibre</i>	Greater	Smaller
<i>Mobility</i>	Less mobile or more fixed	More mobile
<i>Mesentery</i>	Mesoappendix Transverse mesocolon Sigmoid mesocolon	Mesentery for jejunum and ileum
<i>Appendices epiploicae</i>	Present (but absent from caecum, vermiform appendix and rectum)	Absent
<i>Taeniae coli</i>	Present	Absent
<i>Sacculations (haustrations)</i>	Present	Absent

Quiz 1 (differences between small & large intestine)



While performing exploratory laparotomy in a patient with firearm injury to the abdomen, the surgeon says “Oh, the bullet has perforated the large bowel!”.

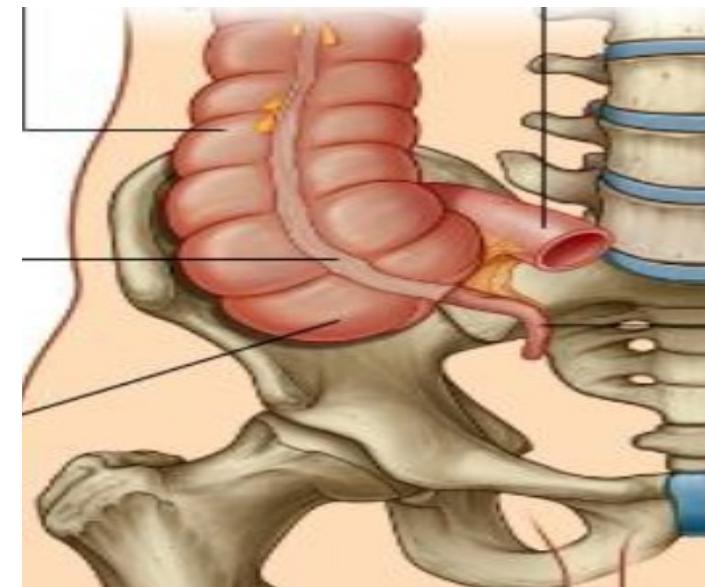
1. Characteristics that could enable the surgeon to identify the large bowel include

.....,.....&.....

Caecum



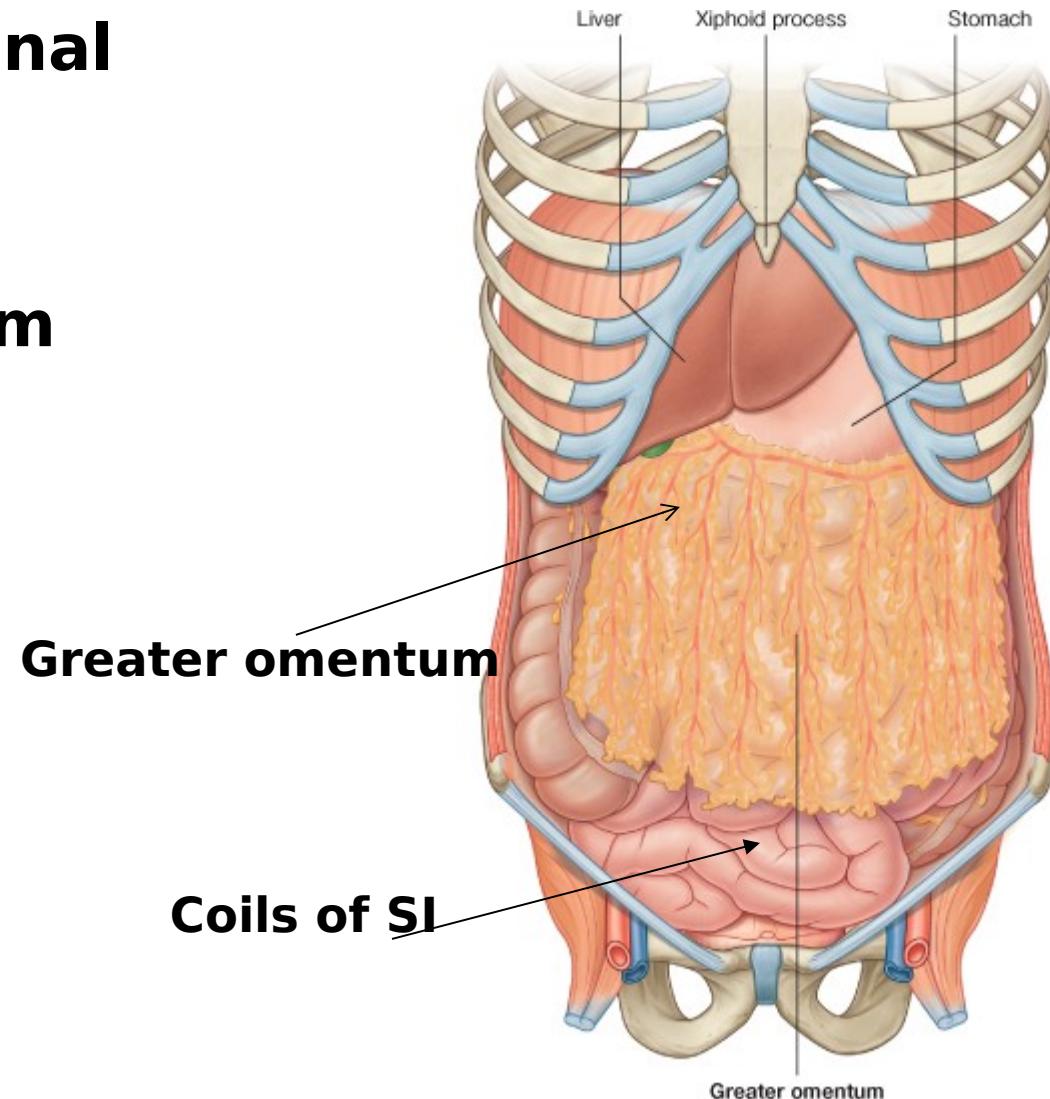
- It is a blind pouch that lies in right iliac fossa , **6 cm** in length
- Continuous upwards with ascending colon
- Receives opening of **ileum and appendix in its posteromedial aspect**
- **Completely covered by peritoneum**



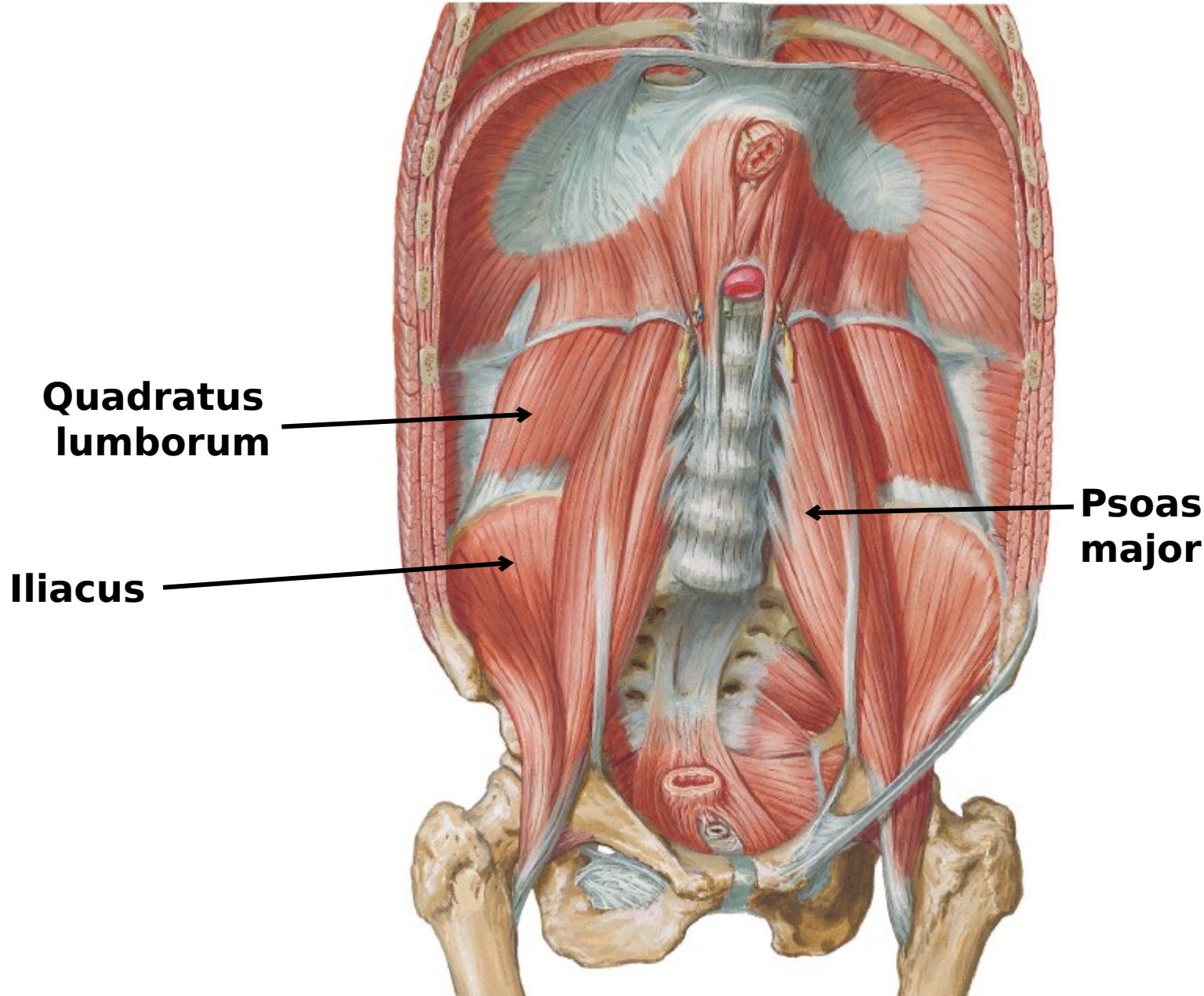
Relations:

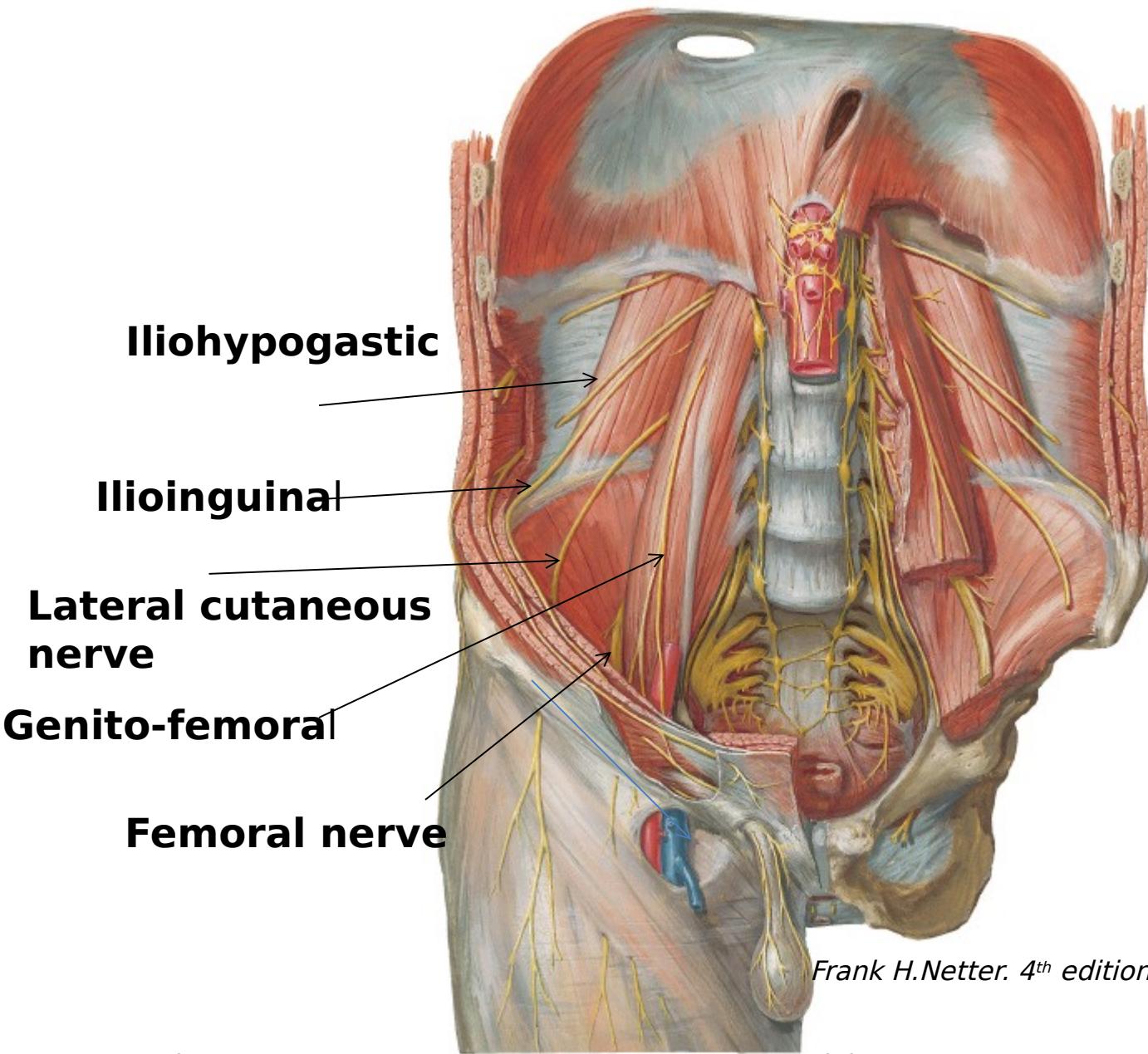
Anterior:

- 1. Anterior abdominal wall**
- 2. Coils of small intestine**
- 3. Greater omentum**



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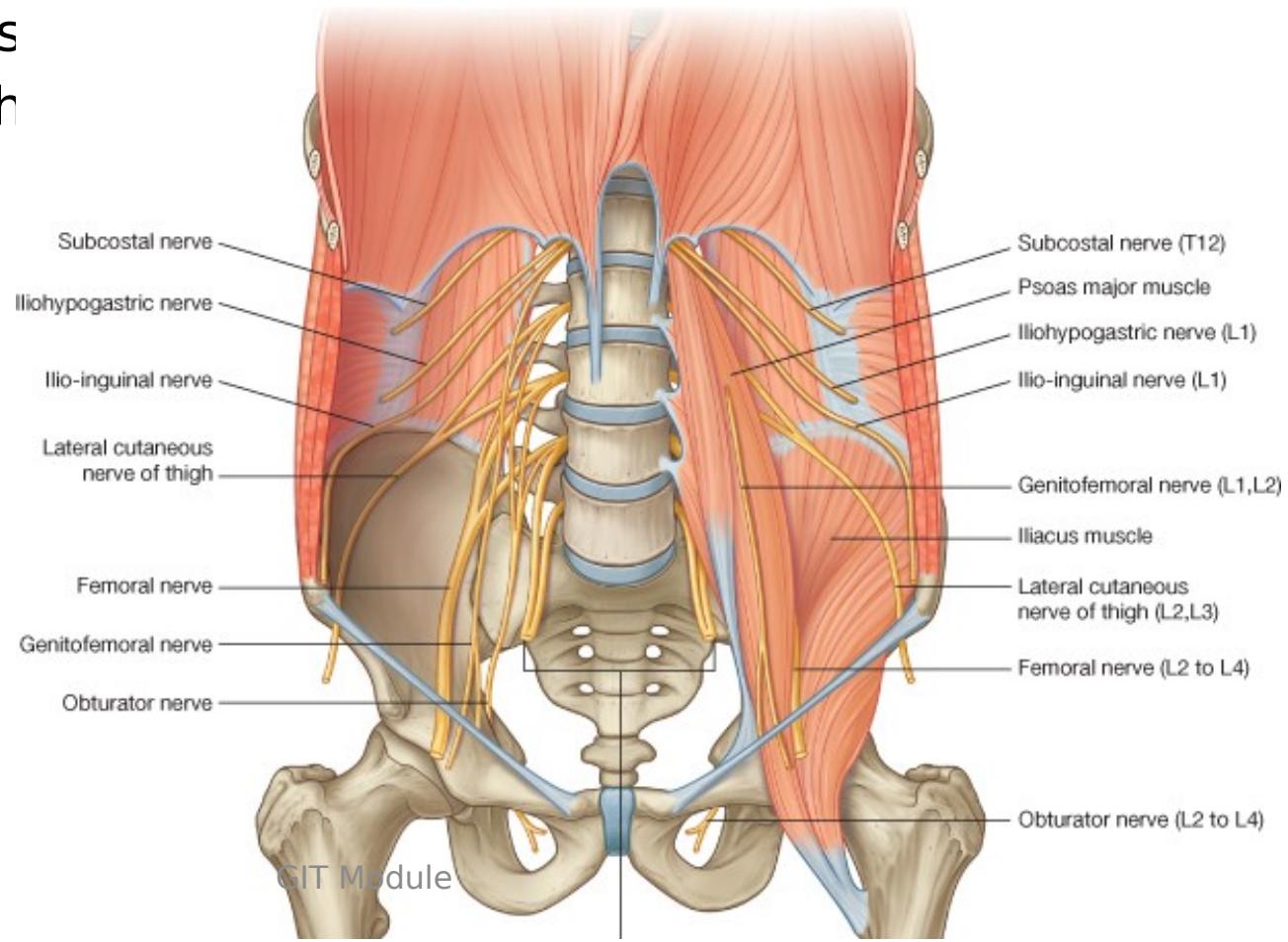


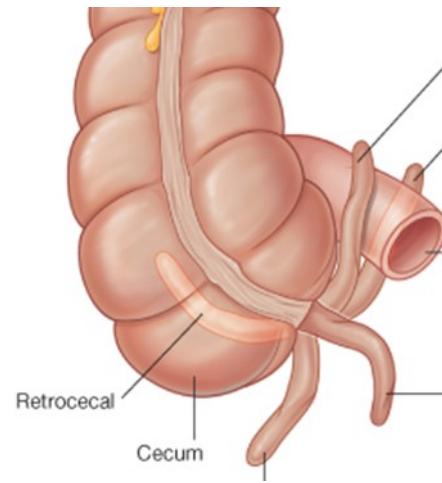
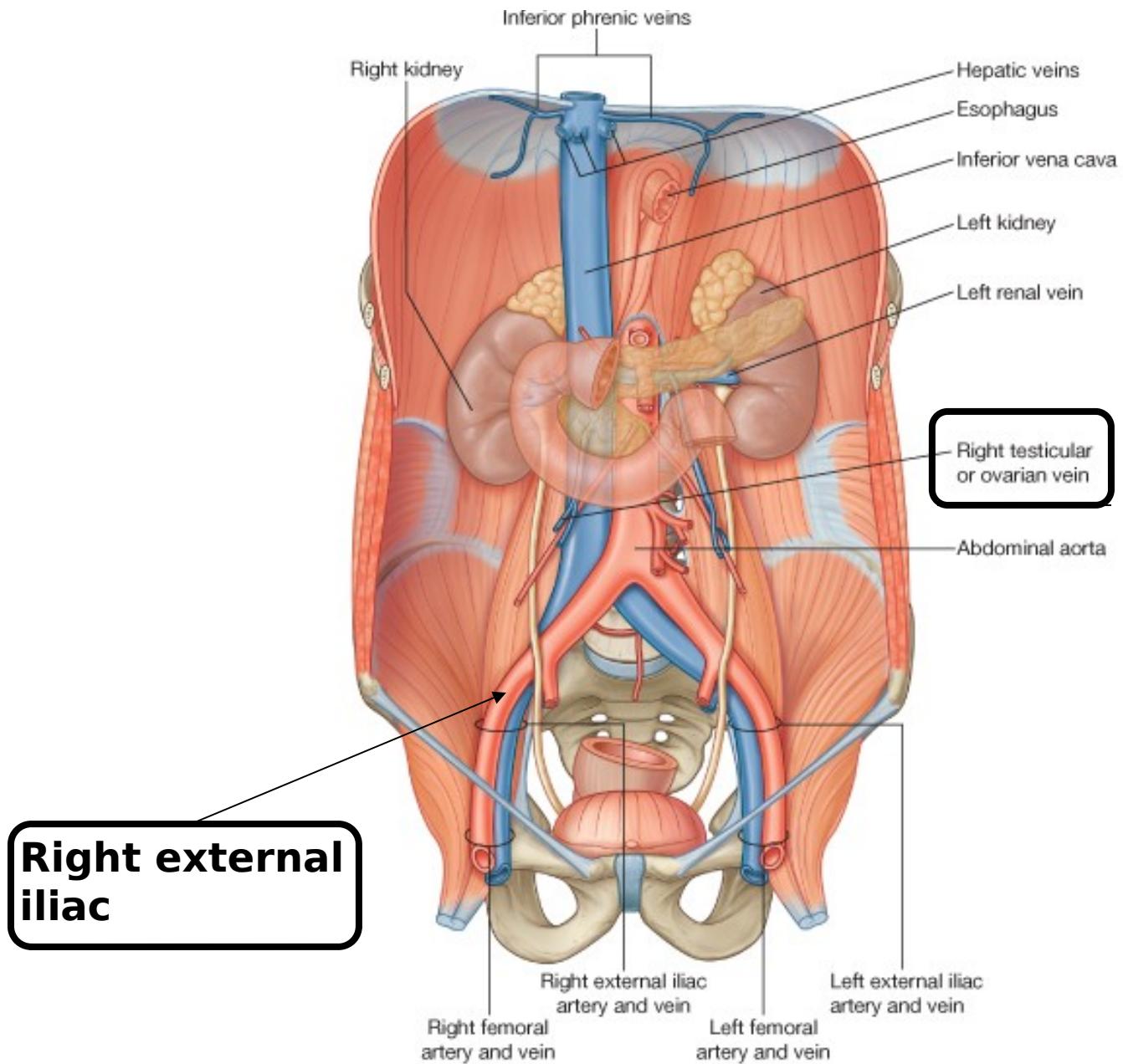


Posterior relations of the caecum



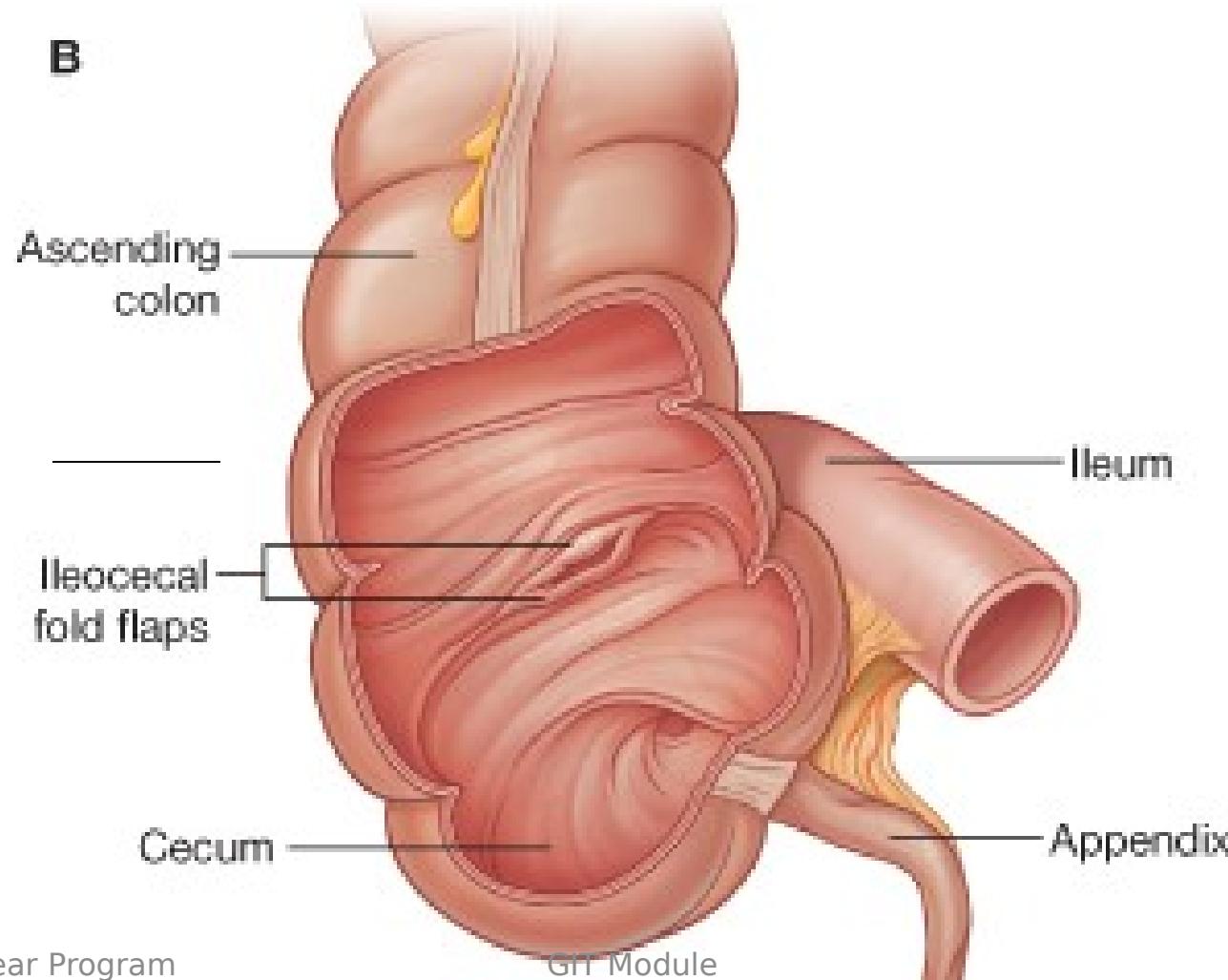
- **Iliacus** & lateral cutaneous nerve of thigh
- **Psoas** & genitofemoral nerve
- Between psoas and iliacus lies the **femoral nerve**
- Right gonadal & right external iliac vessels
- Retro-caecal recess of peritoneum, with the appendix.





Ileocaecal valve:

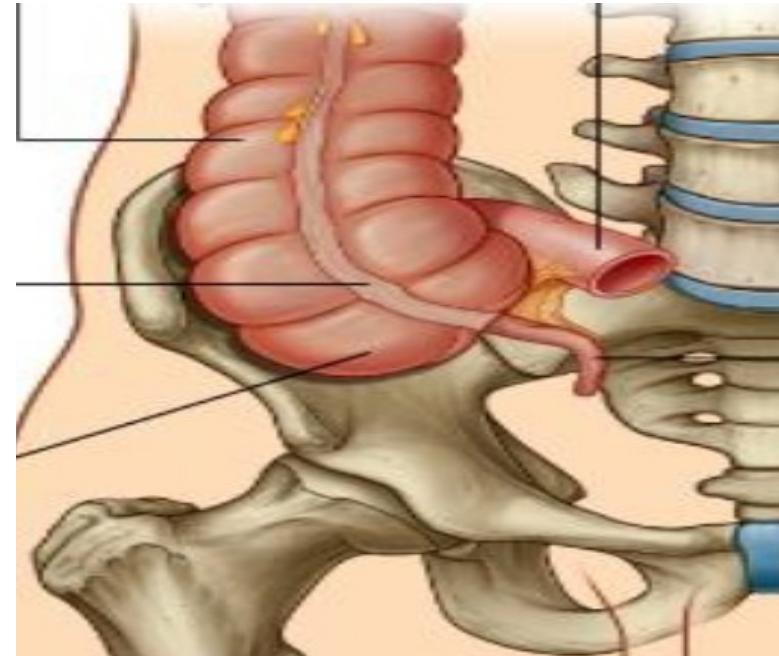
Valve has 2 lips that join at sides to form frenula
Sphincter is derived from circular layer of ileum.



Appendix



- A narrow worm like tube **2- 20 cm**, it lies in right iliac fossa
- Opens in postero- medial aspect of caecum **2 cm** below the ileo caecal junction
- 3 Taenia coli meet at base of appendix



Different positions

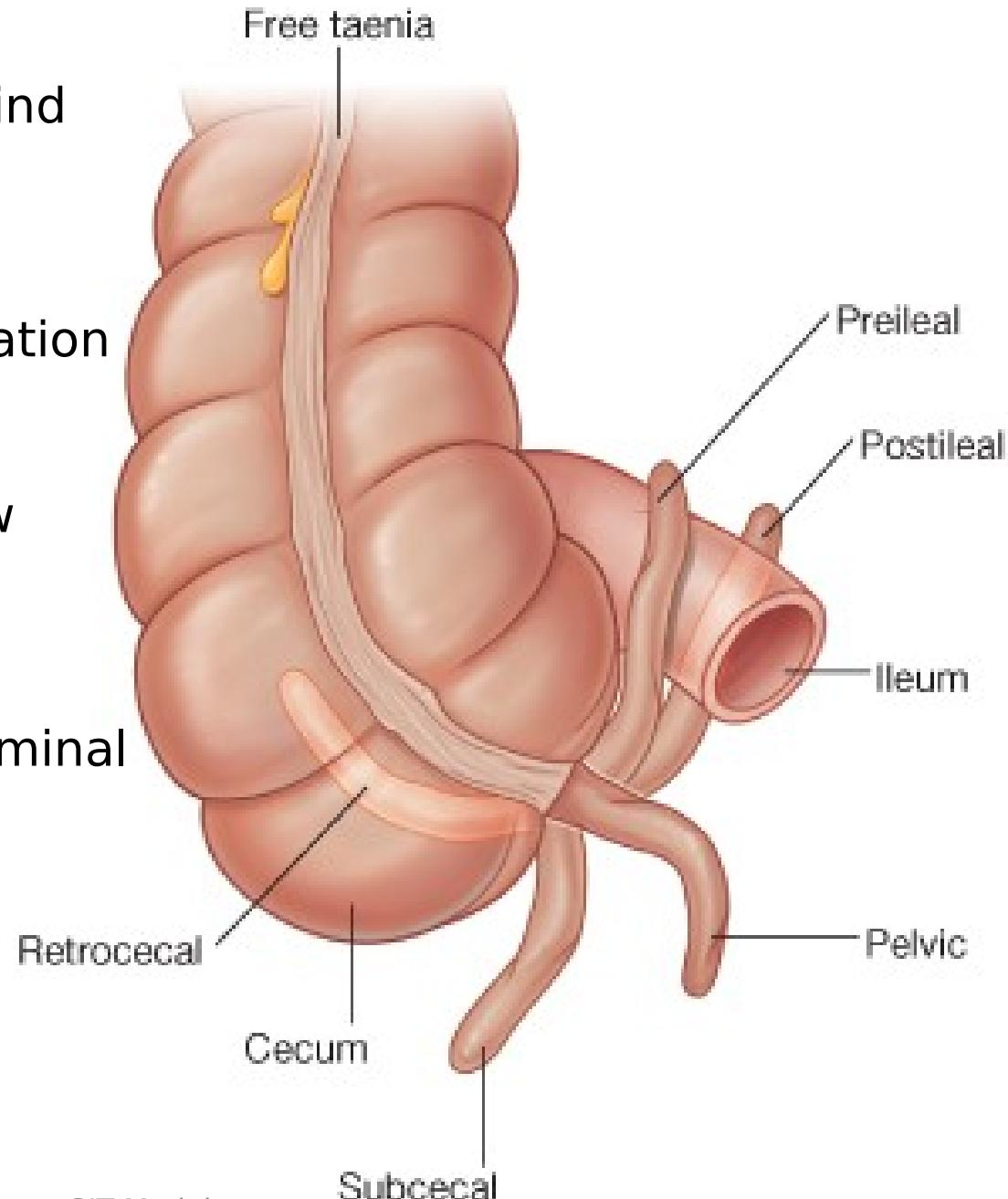
1. **Retro ceacal:** 65% behind caecum in retrocaecal recesss

2. **Pelvic:** 31% hangs in relation to ovary & uterine tube

3. **Sub ceacal:** 2.5% below caecum

4. **Pre ileal:** 1% in front terminal part of ileum

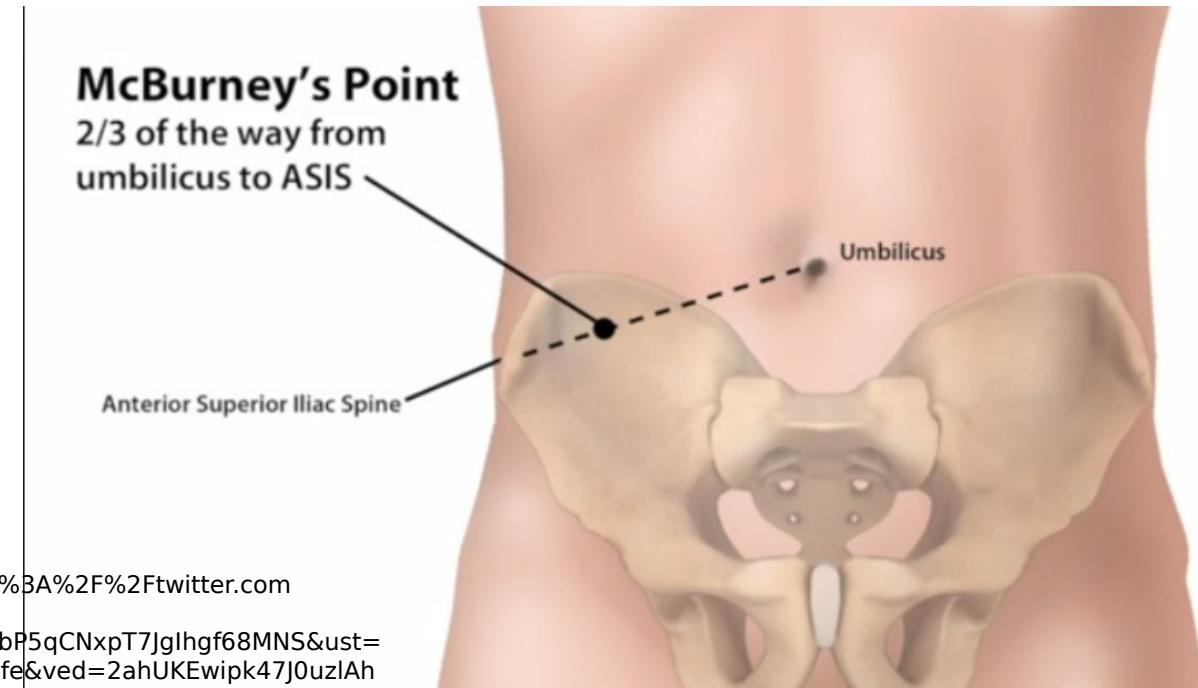
5. **Post ileal:** 0.5% behind terminal part of ileum



Surface Anatomy of the appendix:

Mc Burney's point:

At junction of lateral one third and medial two thirds of line joining **anterior superior iliac spine** and **umbilicus** (**maximum site of tenderness**)



<https://www.google.com/url?sa=i&url=https%3A%2F%2Ftwitter.com%2Fmedicinedoctors%2Fstatus%2F817579883421310976&psig=AOvVaw1bP5qCNxpT7Jglhgf68MNS&ust=1573922021238000&source=images&cd=vfe&ved=2ahUKEwipk47J0uzlAhULgHMKHZQuC1Iqr4kDegUIARDfAQ>

In acute appendicitis pain is referred to the umbilicus???

Pain from the appendix is conveyed by sympathetic fibers to T10 segment which supply skin around the umbilicus

Meso appendix:

Mesoappendix is triangular in shape & has a base & 2 borders

1- Base

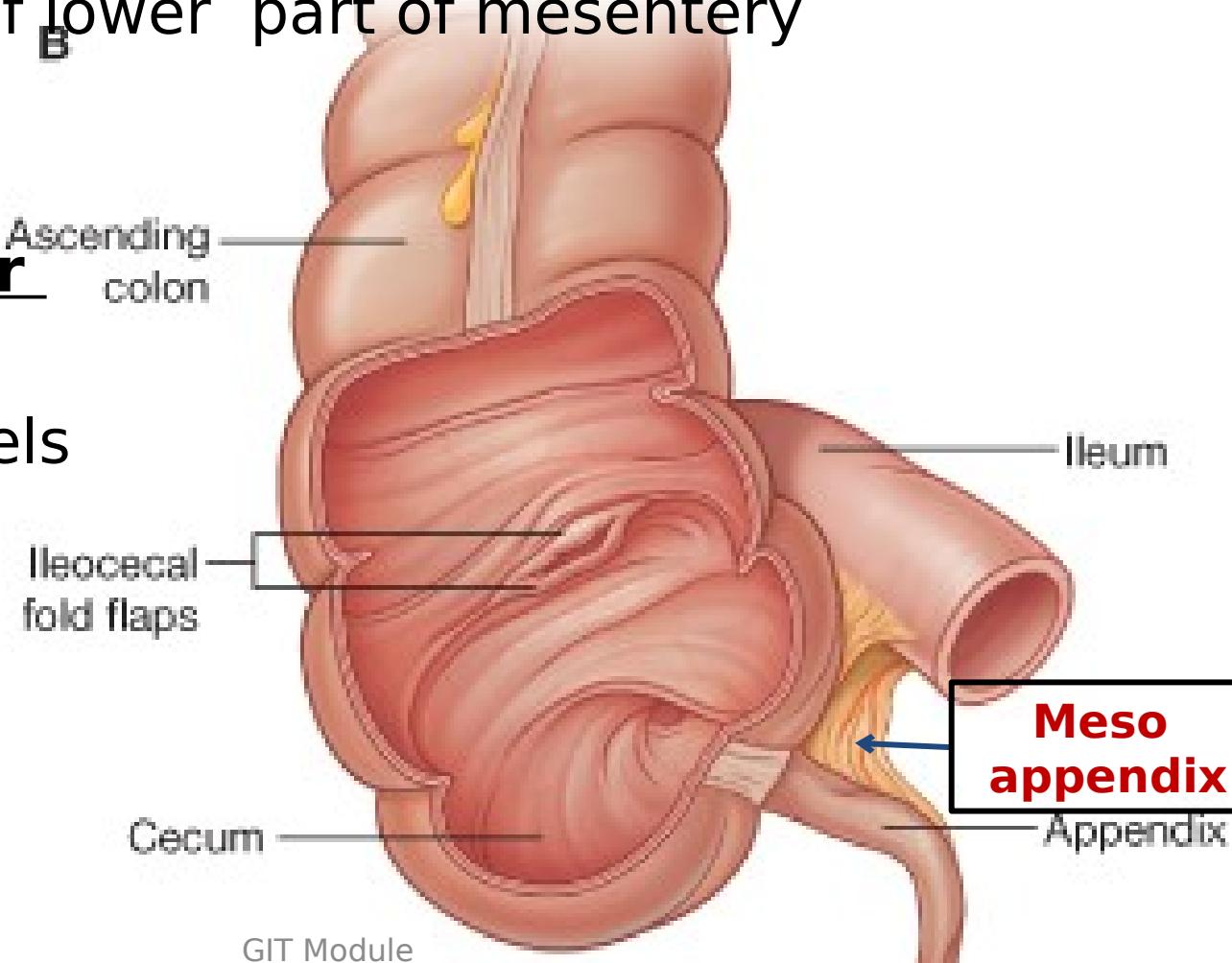
attached to back of lower part of mesentery

2- One border

contains appendix

3- Other border

is **free** containing
appendicular vessels



Blood Supply of Appendix



- **Appendicular artery** : branch from ileocolic artery from superior mesenteric artery
- **Appendicular vein** drains in ileocolic vein
- **Lymph drainage** : ends in ileocolic **Note:** lymph nodes
 - Acute appendicitis leads to **thrombosis** of the appendicular artery that results in **gangrene** and **perforation** of the appendix.

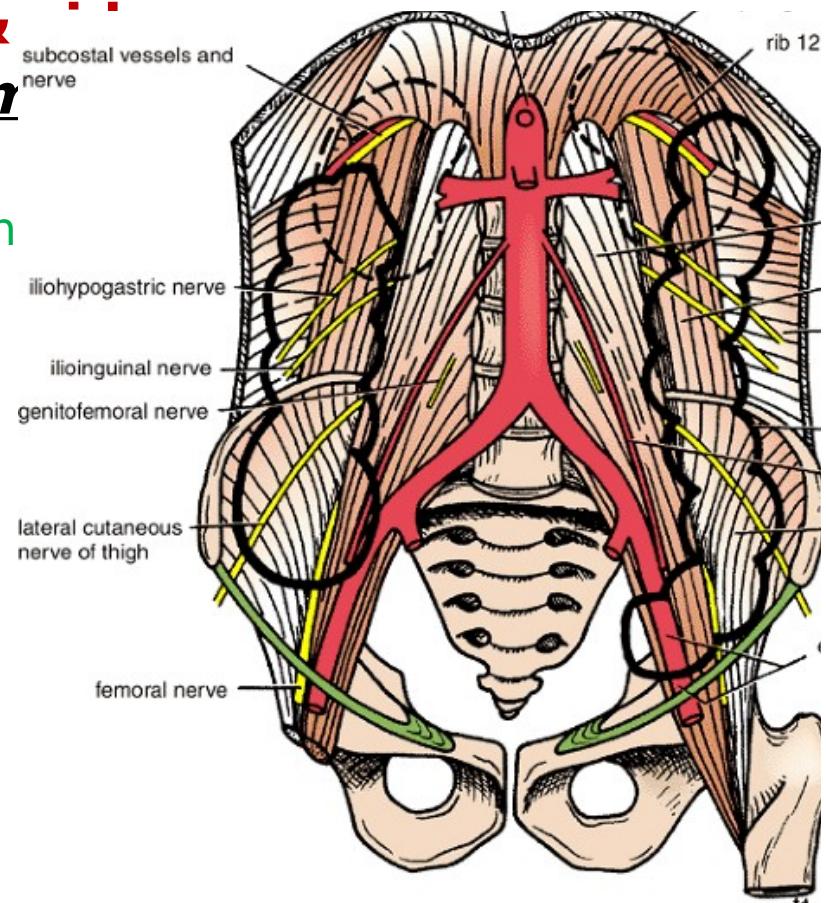
Ascending Colon (15 cm)



- Extends from cecum till inferior surface of liver
- **Covered by peritoneum front & back**
- Anterior relations like caecum

Posterior relations

- **Iliacus** & lateral cutaneous nerve of thigh
- Iliac crest & iliolumbar ligament
- **Quadratus lumborum** & iliohypogastric & ilioinguinal nerves
- Origin of **transversus abdominus**
- **Right kidney**



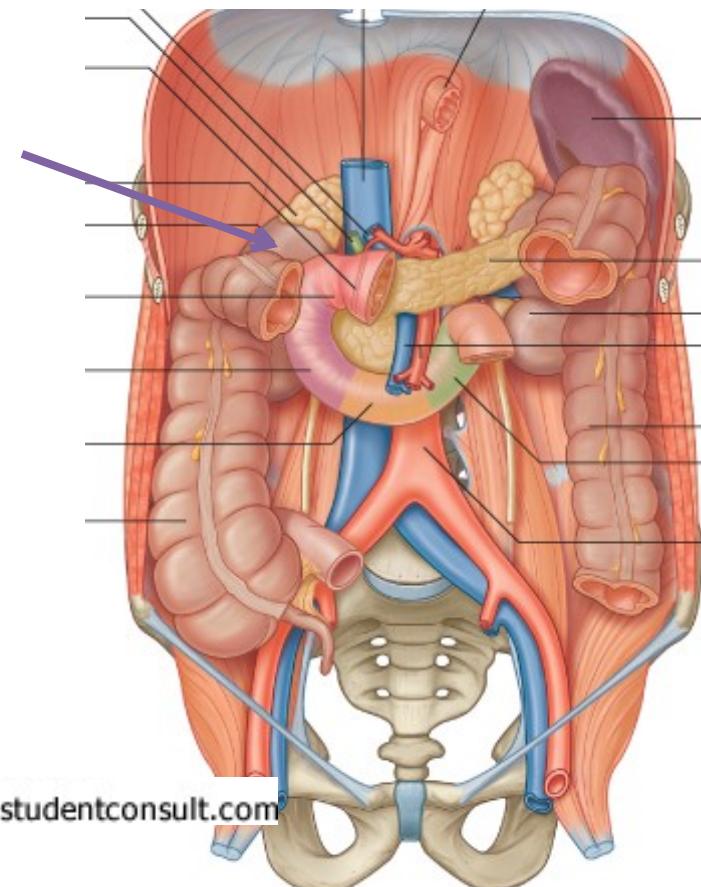
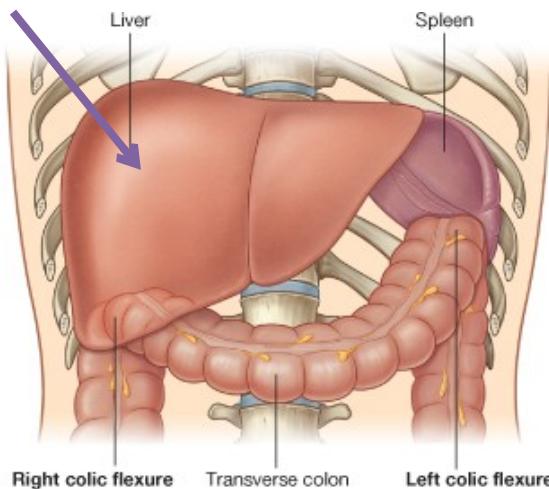


Right colic flexure

Covered by peritoneum except posterior

Right colic flexure is related to right lobe of liver anteriorly

And is related to right kidney posteriorly



Transverse Colon (50cm)

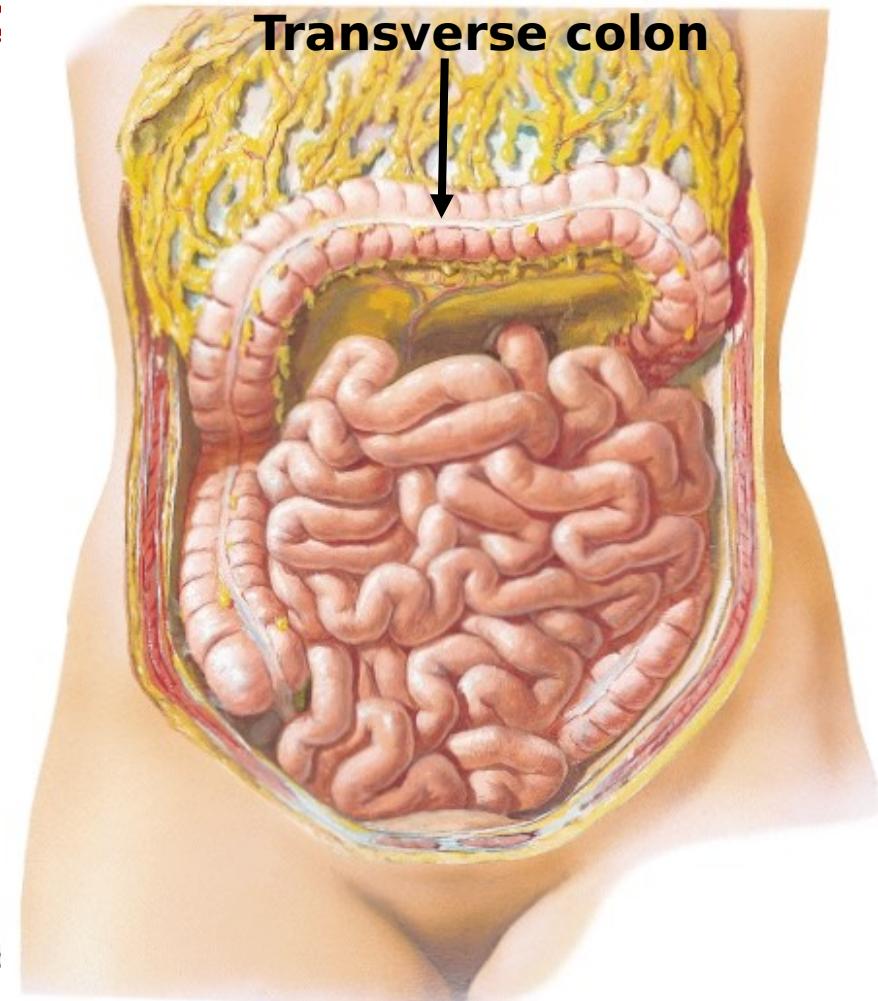


Extends from right colic to left colic flexure

It has mesentery called transverse mesocolon

Contents of transverse Mesocolon

1. Transverse colon
2. Middle colic artery
3. Sympathetic fibers, extraperitoneal fatty tissue & lymph nodes



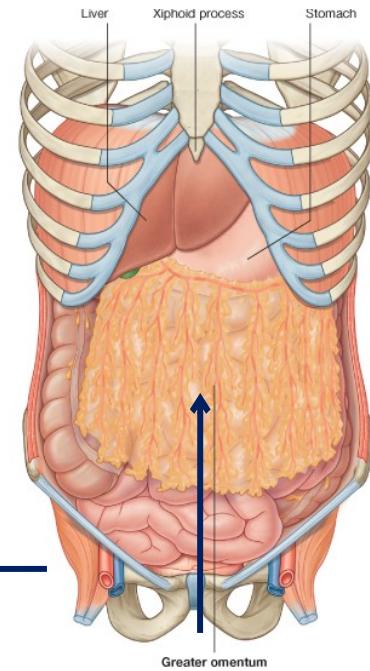
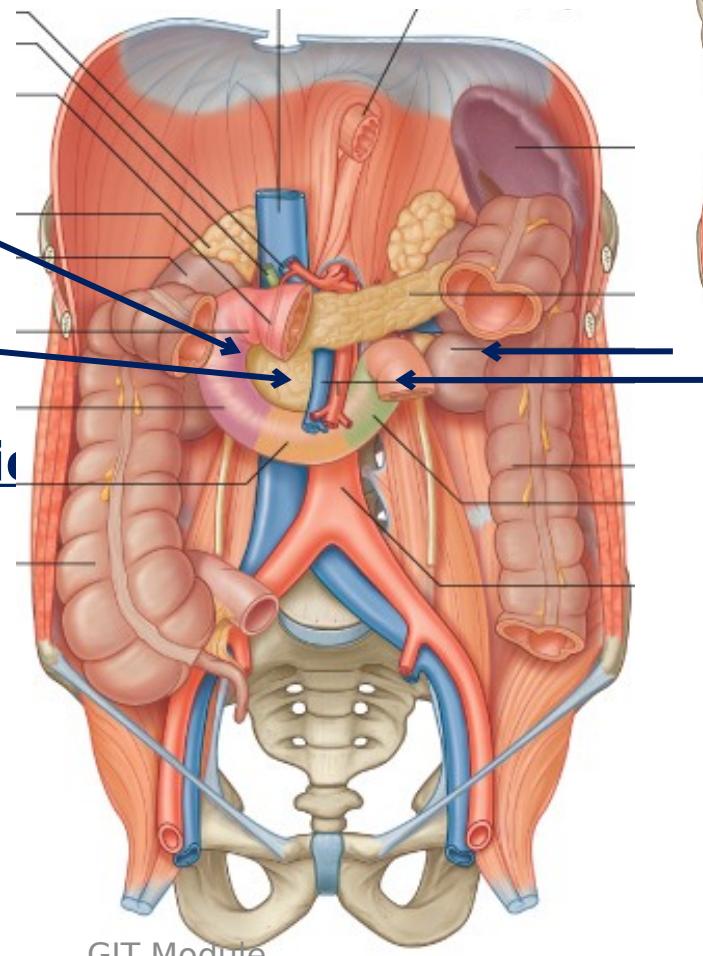
Transverse Colon (50cm)



Anterior relations : posterior 2 layers of greater omentum

Posterior relations :

- 2nd part of duodenum
- Head of pancreas
- Duodeno jejunal junction
& coils of small intestine
- Left kidney



Transverse Colon (50cm)

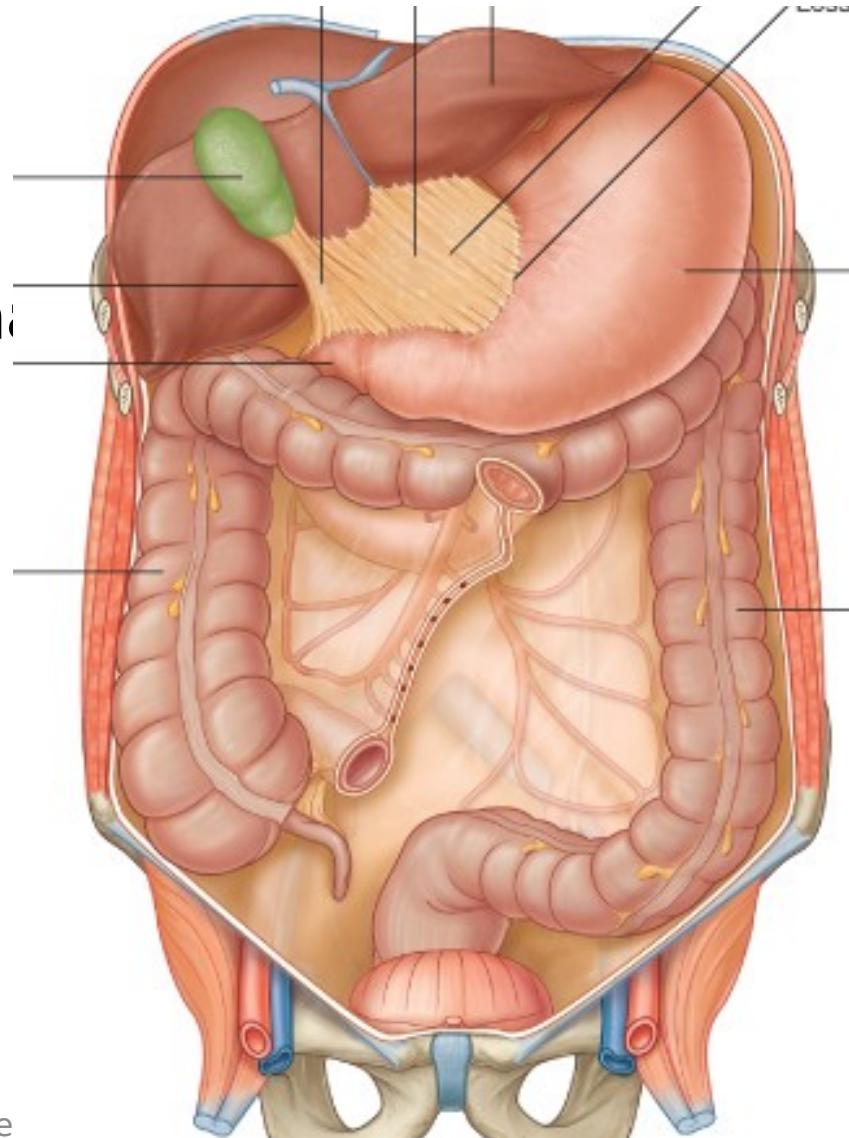


Superior Relations:

- Liver and **gall bladder**
- Greater curvature of **stomach**
- Lateral end of **spleen**

Inferior Relations:

- Coils of **intestine**

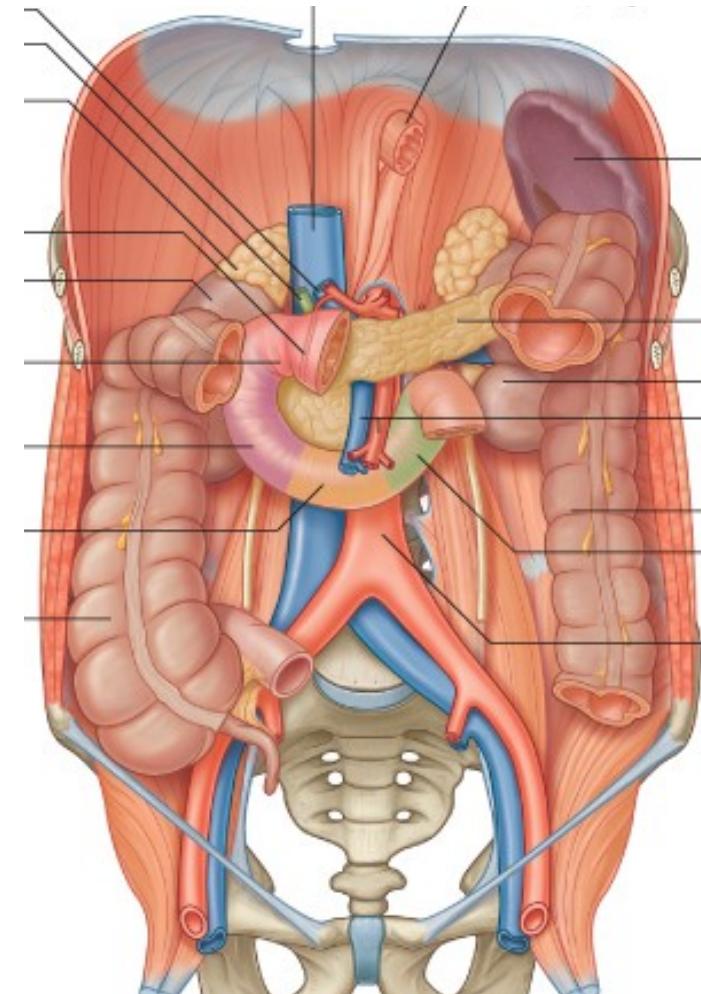


Left colic flexure



- **Covered by peritoneum except posterior**
- It is related to left kidney, tail of pancreas & spleen posteriorly
- Attached to diaphragm by **phrenico-colic ligament**
 - Left colic flexure is
 1. More acute
 2. Higher

than right colic flexure



Descending Colon (25cm)

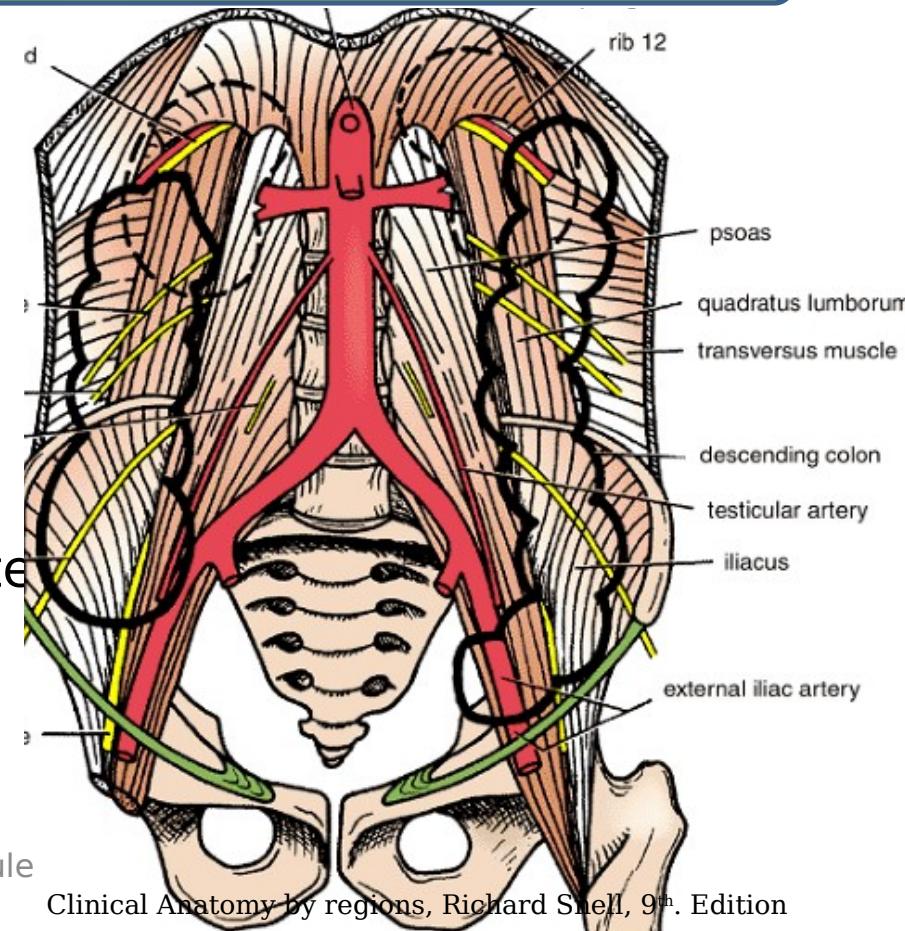


- From left colic flexure down to pelvic inlet
- **Covered by peritoneum from front & sides**

Anterior relations ?????? As ascending colon

Posterior Relation **Equal to cecum + ascending colon + Rt, colic flexure**

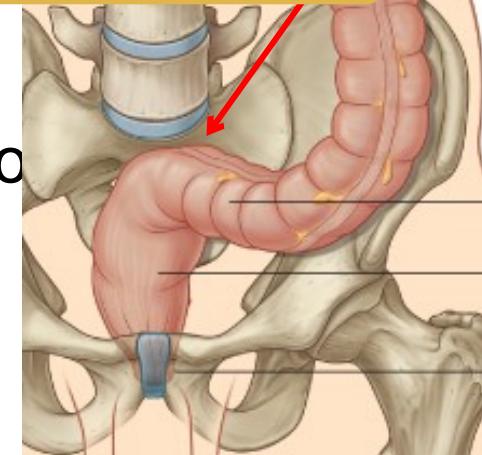
1. Left kidney.
2. Origin of transvers abdominus
3. Quadratus lumborum & **subcostal, iliohypogastric & ilioinguinal nerves**
4. Iliacus &.....
5. Psoas &.....
6. **Femoral nerve** between
7. Left gonadal & left external iliac artery



Pelvic or sigmoid Colon

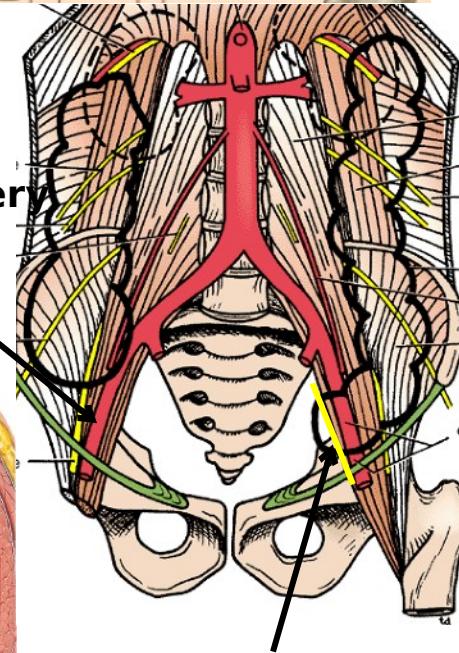
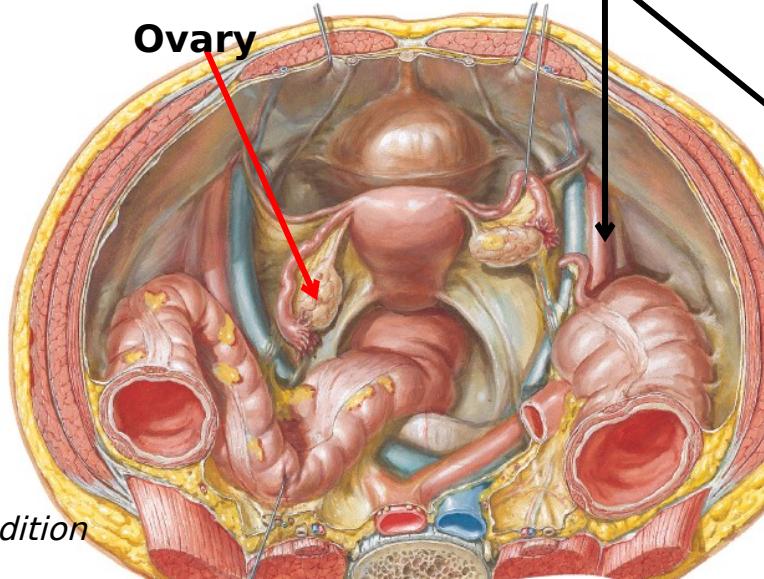


- It **begins** at pelvic brim
- **Ends** at **3 sacral piece** to become continuous with rectum
- It forms a loop that descends downwards on pelvic wall in contact with

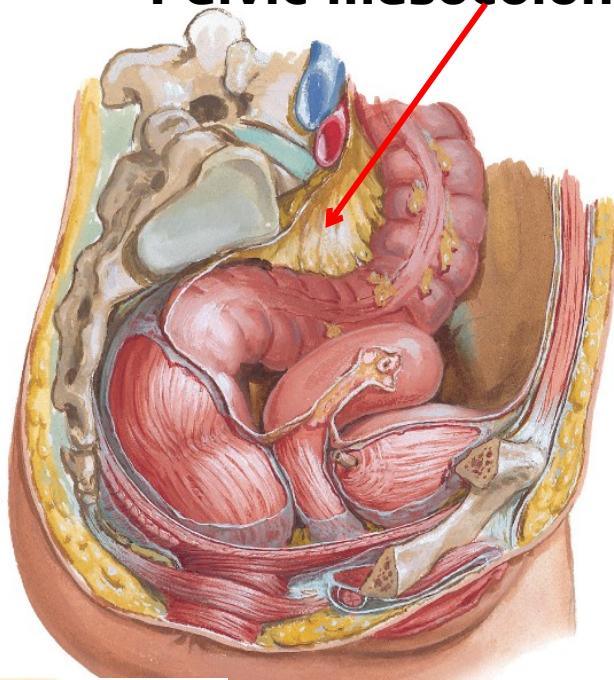


1. Left external iliac vessels
2. Left obturator nerve
3. Vas in males or ovary in females

- Then the pelvic colon crosses pelvic cavity horizontally



Pelvic mesocolon

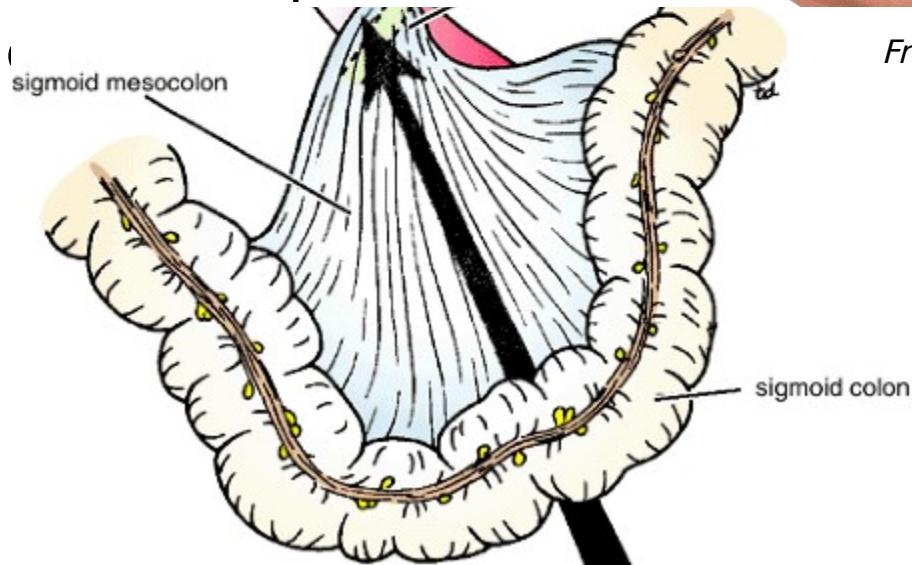


Pelvic Mesocolon

- It has free border that encloses pelvic colon
- Attached border: inverted V shaped

Contents

1. Pelvic colon
2. Superior rectal artery
3. Sigmoid artery
4. Sympathetic fibers, extraperitoneal fat tissue & lymph nodes



Frank H. Netter, 4th edition

Quiz 2 (parts of large intestine)



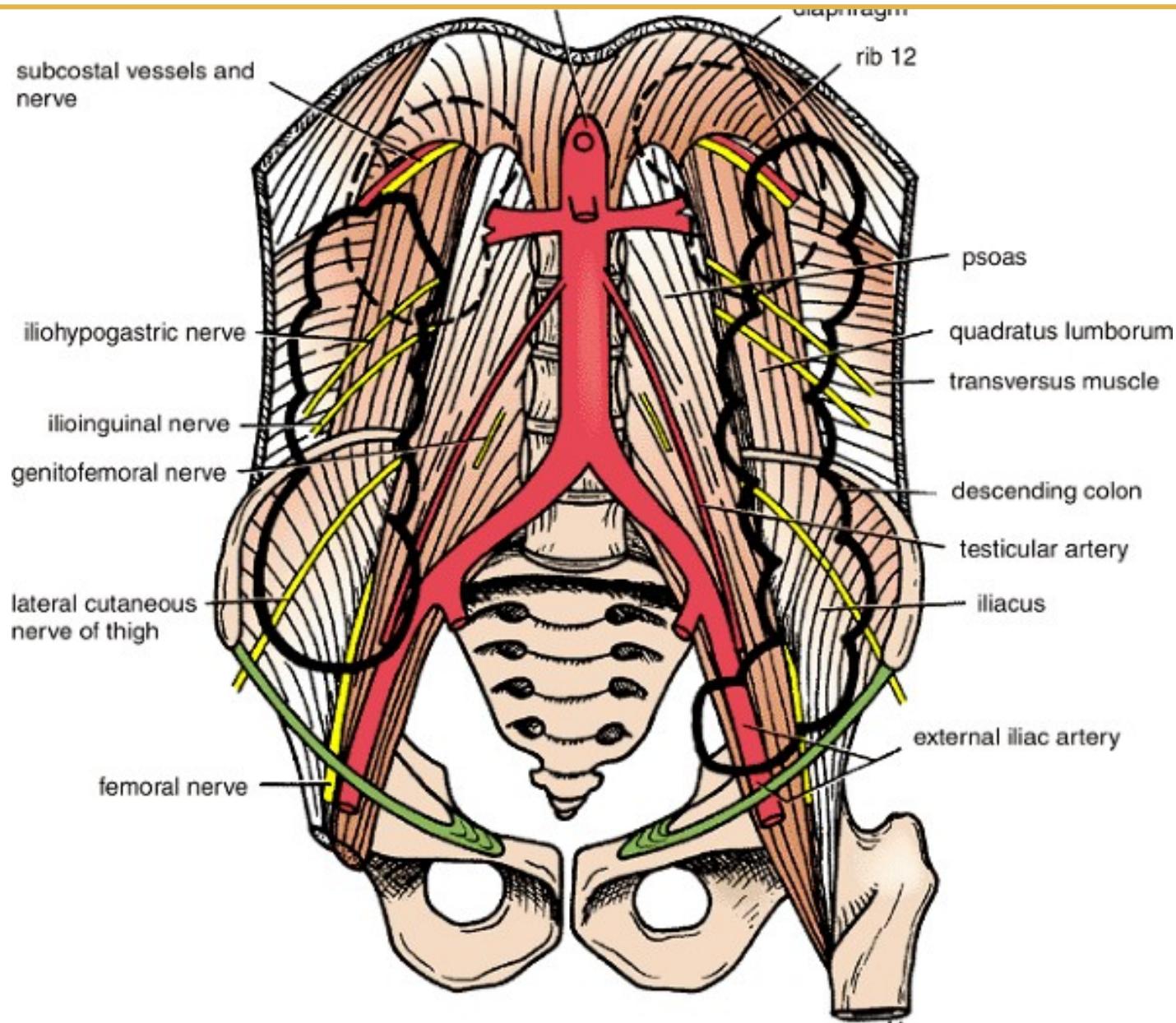
Which part of the abdominal viscera lies retroperitoneal?

- a. Jejunum**
- b. Ileum**
- c. Ascending colon**
- d. Transverse colon**
- e- Pelvic colon**

The commonest position of appendix is:

- a- Preileal**
- b-Postileal**
- c-Pelvic**
- d- Retrocaecal**
- e- Subhepatic**

Quiz 2



Do you remember posterior relations of large intestine???????

Quiz 2



- Parts of the colon that are completely covered by peritoneum include.....
.....,
..... &
.....

Blood Supply of large intestine



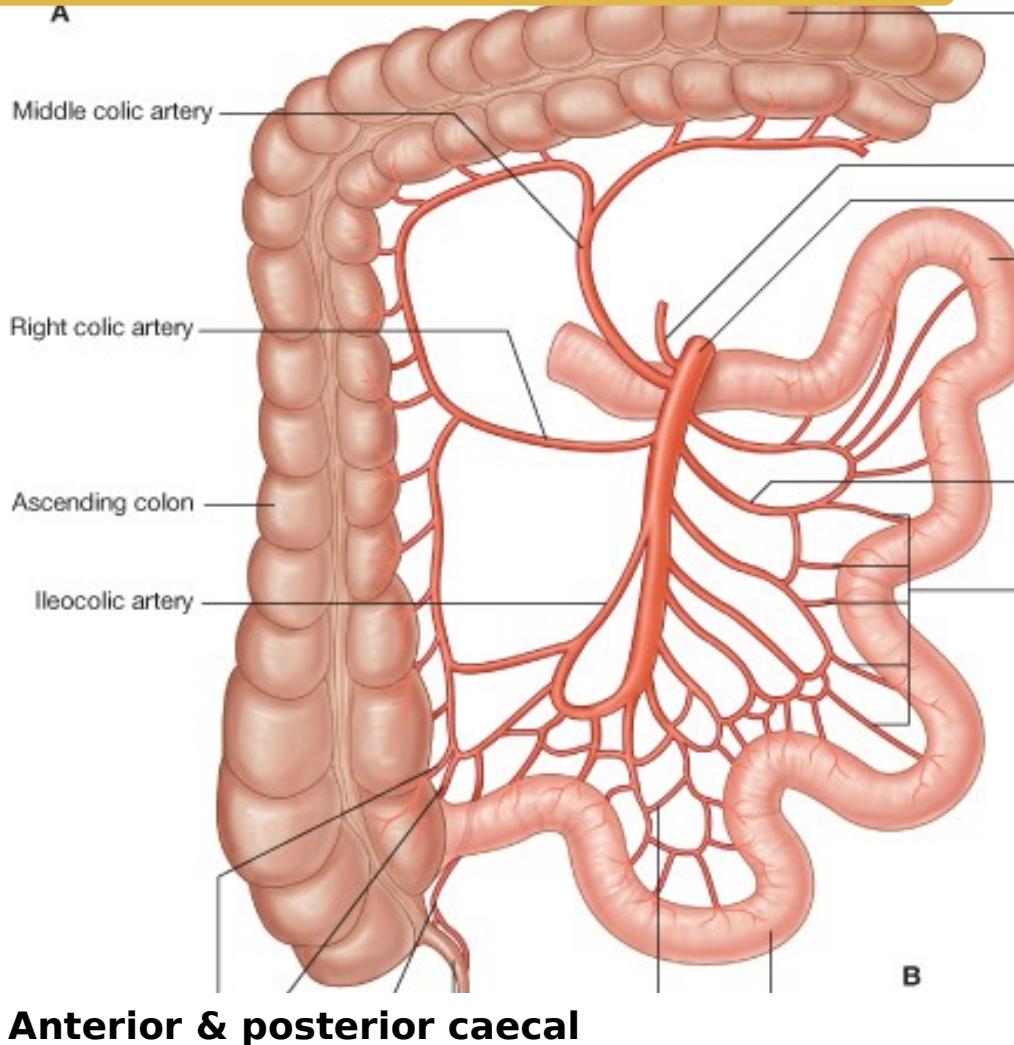
Branches of **superior mesenteric artery** till the junction of right two thirds of transverse colon

1. **Caecum** : anterior & posterior caecal from ileocolic

2. **Ascending colon**: ileocolic & right colic

3. **Right colic flexure** : right colic

4. **Transverse colon** : right 2/3 by middle colic



Anterior & posterior caecal

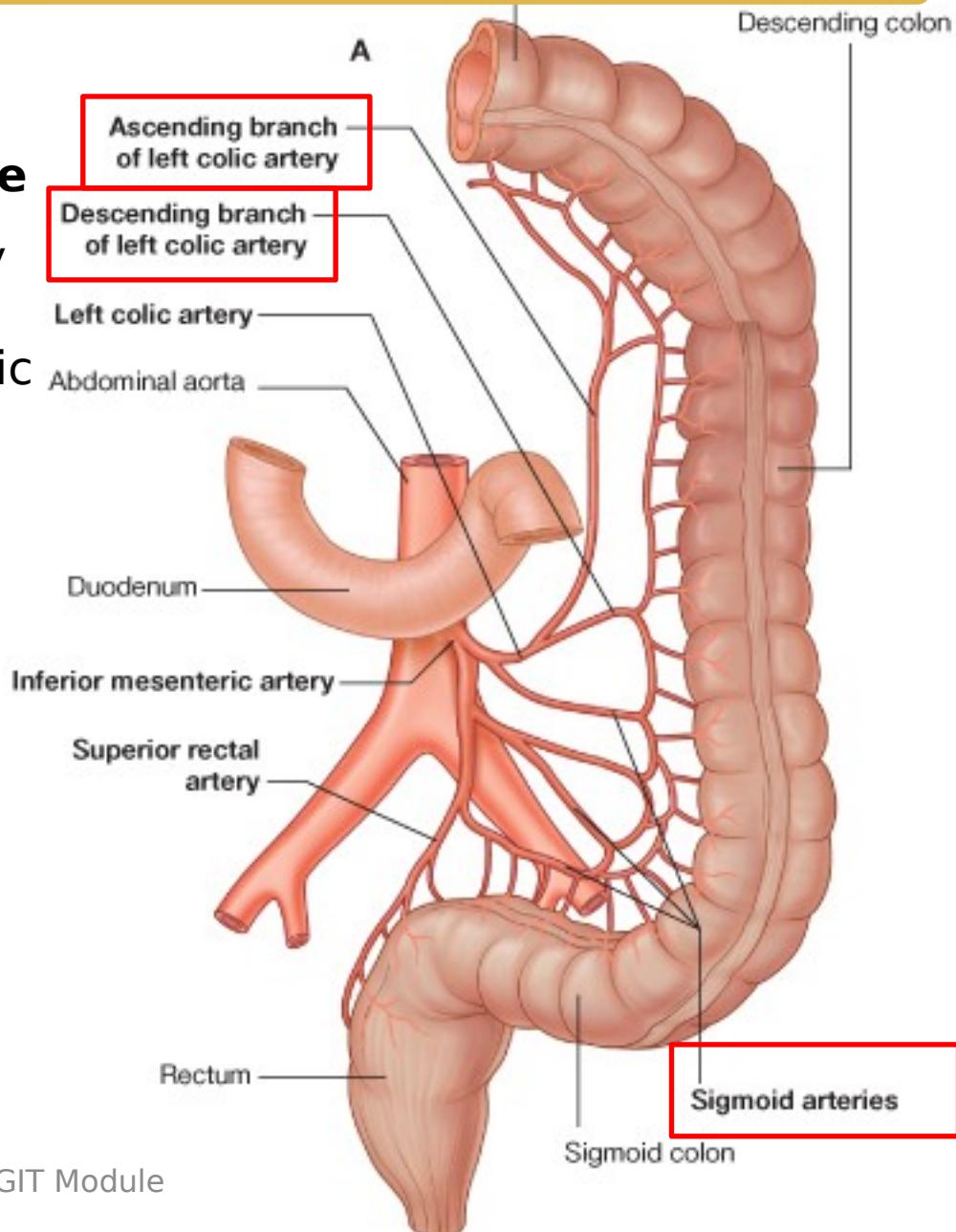
Blood Supply of large intestine



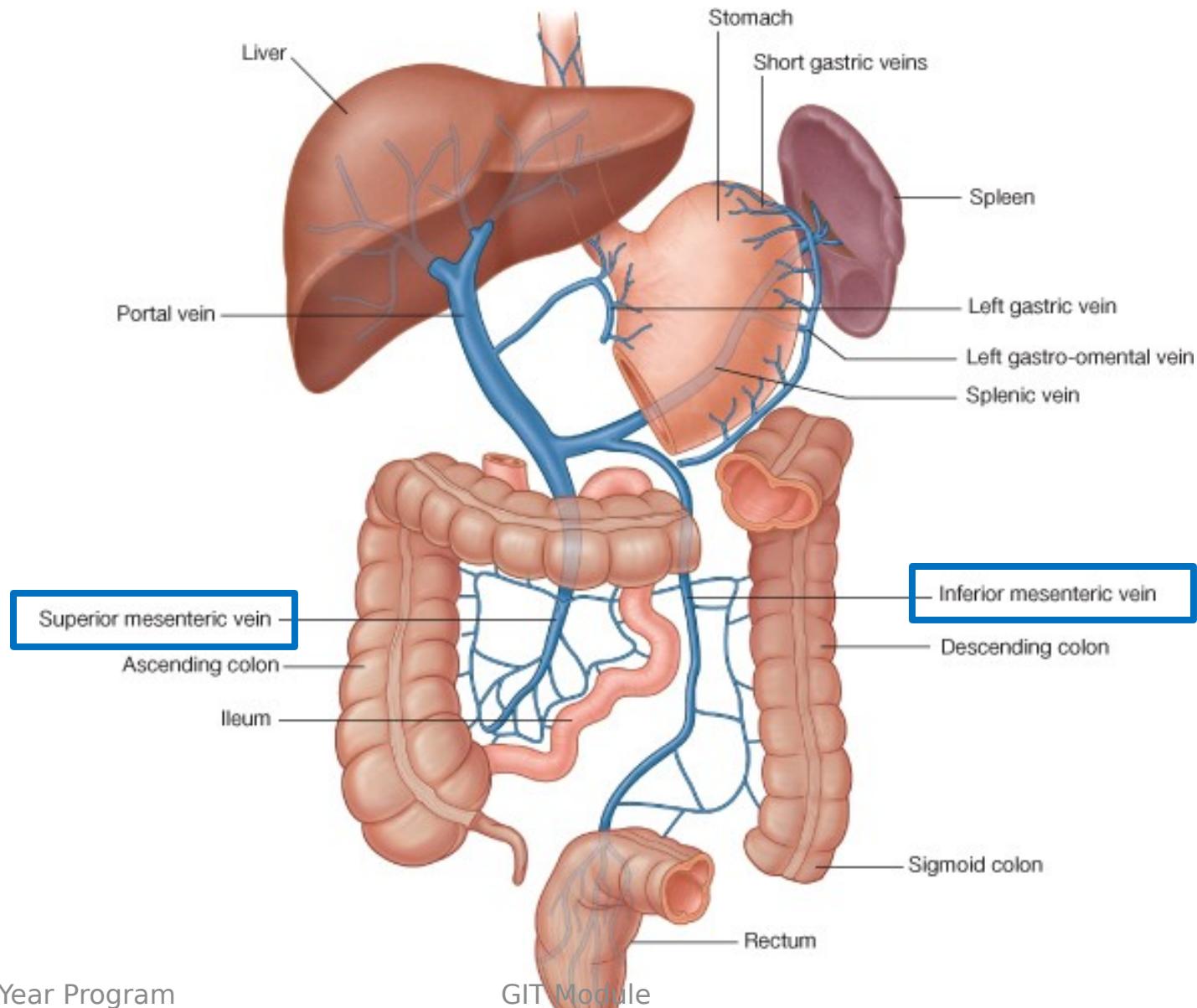
Branches of inferior mesenteric artery

From left one third of transverse colon (link to Embryology)

1. **Transverse colon** : left 1/3 by left colic artery
2. **Left colic flexure** : by left colic
3. **Descending colon** : left colic & upper sigmoid arteries
4. **Pelvic colon**: sigmoid arteries



venous drainage : superior & inferior mesenteric vein



Lymphatic Drainage

1- Epicolic LN:

on the wall of colon

2- Paracolic LN:

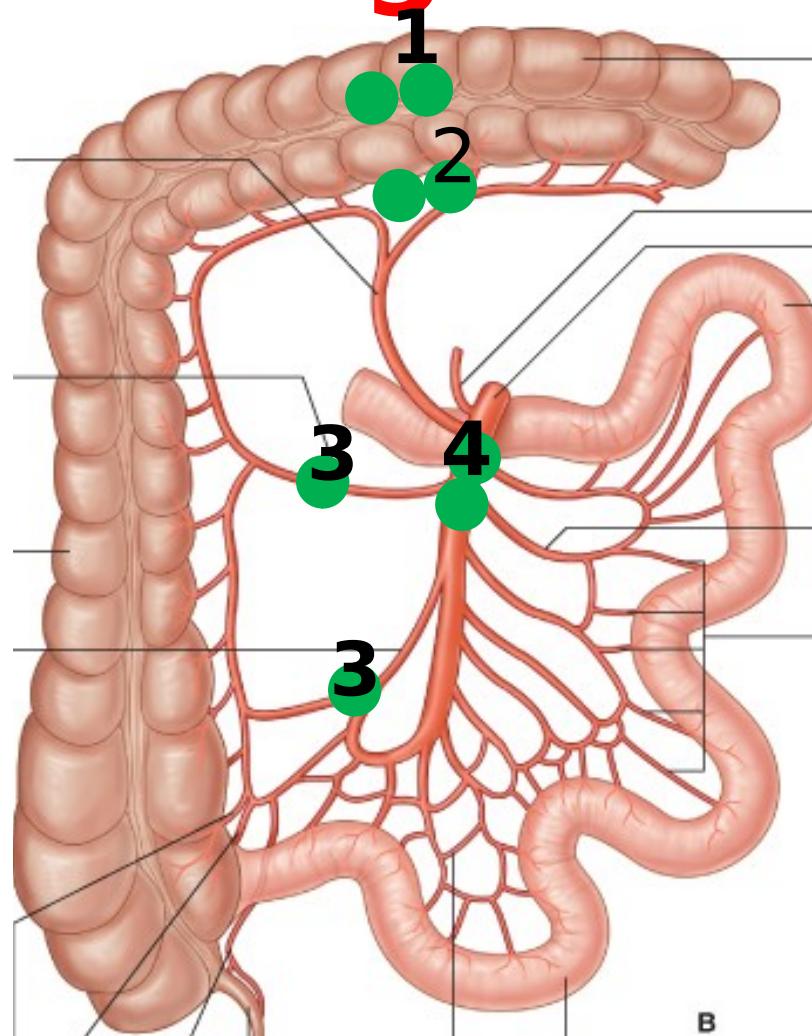
on medial borders of ascending & descending colon & mesenteric border of transverse colon

3- Intermediate LN:

along ileocolic, middle colic, right colic , left colic & sigmoid arteries

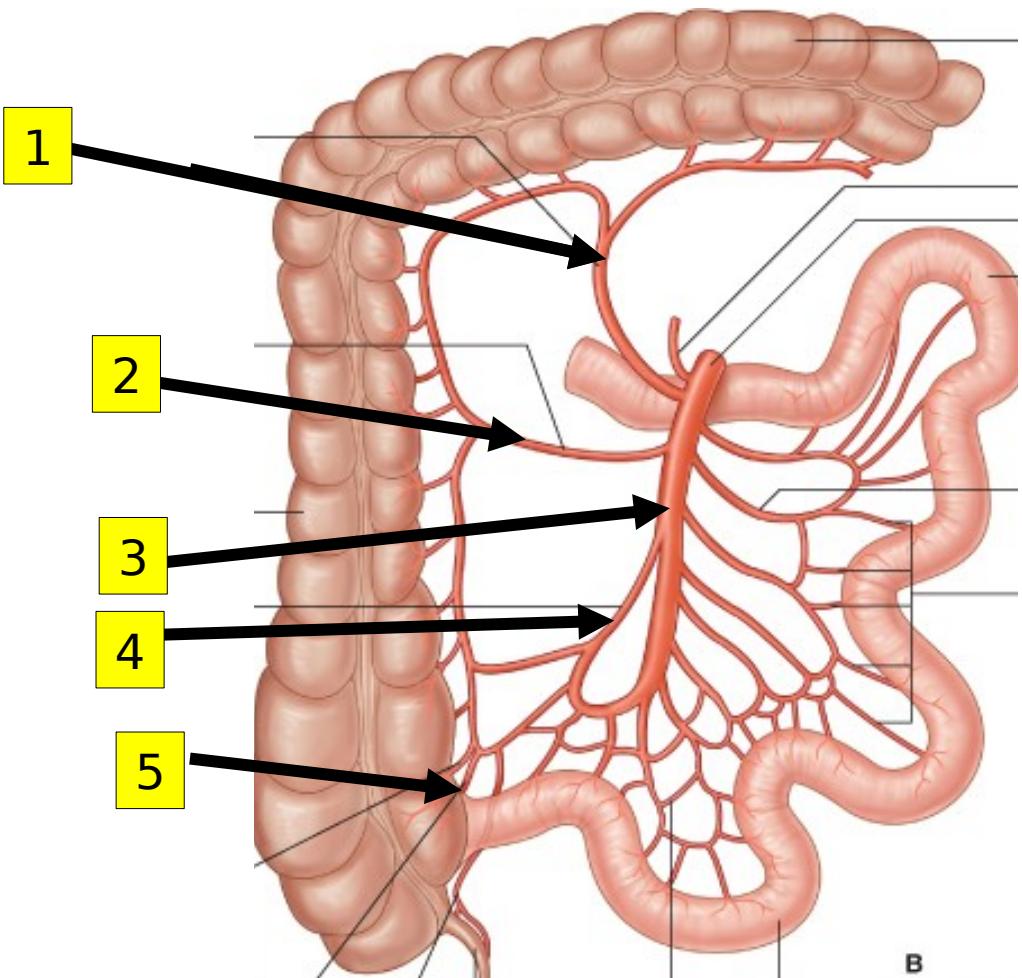
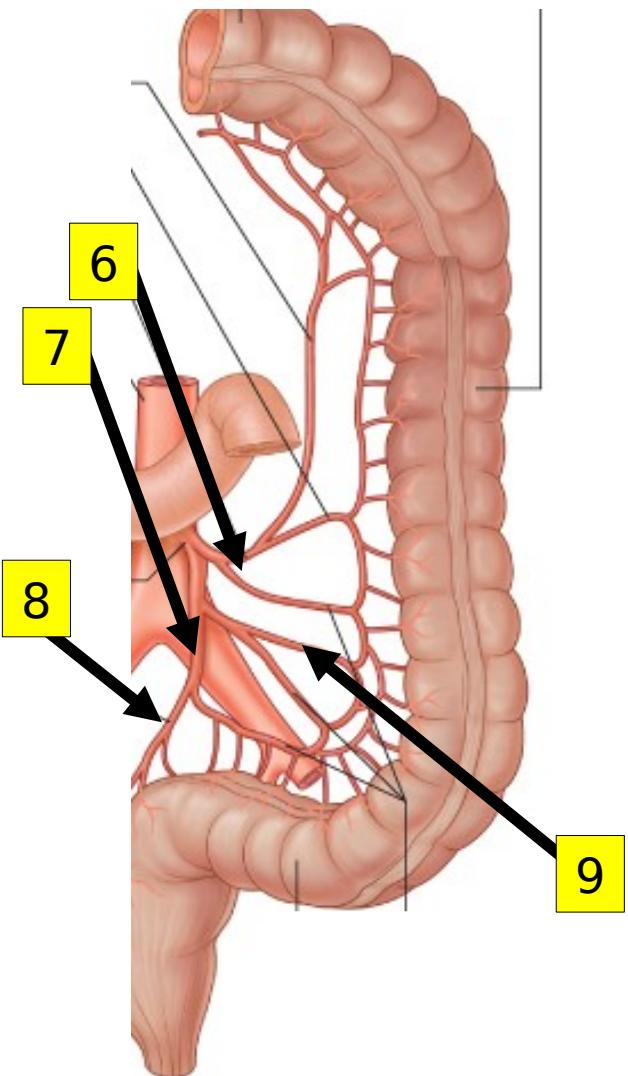
4- Terminal colic LN:

along trunks of superior & inferior mesenteric



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Quiz 3 (blood supply & lymphatic drainage)



B

Summary



1. Features of large intestine
2. Different parts of large intestine (shape, size, relations & peritoneal covering)
3. Blood supply & lymphatic drainage of large intestine

SUGGESTED TEXTBOOKS



1. Clinical Anatomy by regions, Richard Snell, 9th. Edition pages 180- 184.
2. Atlas of human anatomy, Frank Netter, 4th. Edition plates 269- 271.

Thank you